May 1, 2003

Mr. J. A. Scalice
Chief Nuclear Officer and
Executive Vice President
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, Tennessee 37402-2801

SUBJECT: WATTS BAR NUCLEAR PLANT, UNIT 1 — ISSUANCE OF EXIGENT AMENDMENT REGARDING VENTING OF THE HOT LEG SAFETY INJECTION LINES OF THE EMERGENCY CORE COOLING SYSTEM (TAC NO. MB8382)

Dear Mr. Scalice:

The Commission has issued the enclosed Amendment No. 43 to Facility Operating License No. NPF-90 for Watts Bar Nuclear Plant, Unit 1. This amendment consists of a change to the Technical Specifications (TSs) in response to your application dated April 8, 2003, as supplemented by letter dated April 22, 2003. Pursuant to Title 10, *Code of Federal Regulations* (10 CFR) Section 50.91(a)(6), you requested that your application be processed as an exigent TS amendment.

The requested change would revise, for one time only, a portion of Surveillance Requirement (SR) 3.5.2.3 of the Watts Bar TSs for the emergency core cooling system (ECCS). The revision would extend, until the refueling outage in the fall of 2003, the verification that the ECCS safety injection hot leg injection lines are full of water. SR 3.5.2.3 currently requires a verification frequency of 31 days.

A copy of the safety evaluation is also enclosed. Notice of issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

/RA/

Kahtan N. Jabbour, Senior Project Manager, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-390

Enclosures: 1. Amendment No. 43 to NPF-90
2. Safety Evaluation

cc w/enclosures: See next page

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TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-390

WATTS BAR NUCLEAR PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 43
License No. NPF-90

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Tennessee Valley Authority (the licensee) dated April 8, 2003, as supplemented by letter dated April 22, 2003, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-90 is hereby amended to read as follows:

   (2) Technical Specifications and Environmental Protection Plan

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 43, and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated into this license. TVA shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of its issuance, and shall be implemented no later than 30 days from the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Allen G. Howe, Chief, Section 2
Project Directorate II
Division of Project Licensing Management
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: May 1, 2003

ATTACHMENT TO AMENDMENT NO. 43

FACILITY OPERATING LICENSE NO. NPF-90

DOCKET NO. 50-390

Replace the following pages of the Appendix A Technical Specifications with the attached pages. The revised pages are identified by amendment number and contain vertical lines indicating the area of change.

Remove Pages	Insert Pages
3.5-5	3.5-5
B 3.5-18	B 3.5-18
B 3.5-19	B 3.5-19

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 43 TO FACILITY OPERATING LICENSE NO. NPF-90

TENNESSEE VALLEY AUTHORITY

WATTS BAR NUCLEAR PLANT, UNIT 1

DOCKET NO. 50-390

1.0 INTRODUCTION

By letter dated April 8, 2003, as supplemented by letter dated April 22, 2003, the Tennessee Valley Authority (TVA or the licensee), submitted a request for an exigent license amendment to revise the Technical Specifications (TSs) for the Watts Bar Nuclear Plant, Unit 1. The requested change would revise, for one time only, a portion of Surveillance Requirement (SR) 3.5.2.3 of the Watts Bar TSs for the emergency core cooling system (ECCS). The revision would extend, until the refueling outage in the fall of 2003, the verification that the ECCS safety injection (SI) hot leg injection lines are full of water. SR 3.5.2.3 currently requires a verification frequency of 31 days. The proposed amendment includes a regulatory commitment to verify the subject piping is full of water following future refueling operations.

The need for the exigent TS revision is due to an emergent issue that occurred when recent ultrasonic testing (UT) of the ECCS hot leg injection piping identified a quantity of gas at the piping high points. TVA could not have reasonably avoided this exigency because it had no indication that the ECCS hot leg injection lines had accumulated gas. The April 22, 2003, letter provided clarifying information that did not change the initial proposed no significant hazards consideration determination or expand the scope of the original request.

2.0 PROPOSED CHANGES

TVA proposed to add a note to SR 3.5.2.3, which requires verification that the ECCS piping is full of water every 31 days. The note states that “Surveillance performance not required for ECCS safety injection hot leg until start up from Fall 2003 refueling outage.” The changes to the TS Bases are consistent with the SR revision.

3.0 EVALUATION

3.1 REGULATORY EVALUATION

Pursuant to Title 10, *Code of Federal Regulations* (10 CFR) Section 50.91(a)(6), TVA requested that its application be processed as an exigent TS amendment. TVA is requesting to postpone, until the refueling outage in the fall of 2003, the verification that the ECCS hot leg injection lines are full of water based on its evaluation that the gas would have an insignificant effect on the safety function of the ECCS. In addition, TVA stated that, in order to reach the

valves used for venting during power operations, this activity presents a challenge both as an industrial safety concern due to high working area temperatures and adjacent hot components, and an as low as reasonably achievable radiological dose concern.

Prior to its April 8, 2003, amendment request, TVA relied upon an administrative program to fulfill SR 3.5.2.3 for the ECCS injection path leading to the hot legs. The administrative program involves examining the operating logs to ensure that no system operating evolution has occurred having the potential to introduce gas into the piping.

The ECCS is designed to cool the reactor as well as to provide additional shutdown capability following initiation of postulated accident conditions. Its primary function following a loss-of-coolant accident is to remove the decay heat from the reactor core. The three phases of ECCS operation are: injection, cold leg recirculation, and hot leg recirculation. The injection phase ensures that enough boron has been added to maintain the reactor sub-critical and the containment sump has sufficient water to supply the ECCS pump for cold leg recirculation. After approximately 9 hours, the ECCS flow is shifted to the hot leg recirculation phase to reduce the boron precipitation in the core. This amendment relates to the potential for gas accumulation in the injection path leading to the hot leg piping (i.e., hot leg recirculation phase).

3.2 TECHNICAL EVALUATION

3.2.1 Licensee Evaluation

Until a U. S. Nuclear Regulatory Commission (NRC) inspector raised questions on the basis for TVA's methodology for surveillance performance, TVA stated that it had no indication that the hot leg SI pipes had accumulated any gas. SR 3.5.2.3 requires that the ECCS piping be verified to be full of water every 31 days. The licensee relied on an administrative program to fulfill the requirements of SR 3.5.2.3 during unit operation. During a forced outage which began on March 10, 2003, a UT of the subject piping was performed and gas was identified at three of the SI hot leg piping high points. Two of them were found to have approximately 1.2 ft^3 and 2.2 ft^3 of gas. The third pocket of gas was found in the residual heat removal injection piping to hot leg 1 and had approximately 7.3 in^3 of gas. The licensee vented the gas pockets and verified the pipe was full of water by UT examination. The subject pipes are to the best of TVA's knowledge filled with water as a result of activities performed on March 13, 2003. TVA determined the most likely mechanism of introducing gas into the hot leg SI piping was an inadequate filling and venting procedure at the end of Refueling Outage 4. Specifically, the current venting procedure for ECCS piping may not be fully effective in removing gas from those portions of the SI system piping.

At 100 percent reactor power, the physical verification (i.e., venting with confirmation by UT examination) that the subject pipes are full of water, which is required by the SR, presents a safety concern due to high working area temperatures and adjacent hot components, and a high radiation environment. Temperatures in the rooms in which the licensee would perform the SR range from 110 ^oF to 130 ^oF. Temperatures at the surface of insulated steam lines are approximately 144 ^oF while other piping surface temperatures exceed 120 ^oF. TVA personnel would need to reach around the piping to access the valve operator and would be exposed to potential burns. In the vicinity of the vents for the subject pipes, there are radiation fields of approximately 600-800 mrem/hr gamma and 20-40 mrem/hr neutron.

Once the gas was identified, TVA determined that its existing administrative methodology may not have provided sufficient assurance for those specific pipes. Since the SR is required every 31 days and there are approximately 6 months left in the current fuel cycle, TVA requests an exigent amendment to revise the Operating License to change the TS SR 3.5.2.3 frequency to extend the verification that the SI hot leg injection pipes are full of water until the refueling outage in the fall of 2003. All other ECCS components would continue to be vented as required by SR 3.5.2.3. TVA is requesting that the SR portion associated with the SI hot leg pipes be extended to the fall 2003 refueling outage to avoid an unnecessary personnel safety risk. TVA contends that exigent circumstances exist because of the short timeframe in which the license amendment must be reviewed. Subsequent to the SI hot leg venting on March 13, 2003, TVA performed another surveillance per SR 3.5.2.3 on March 24, 2003, and used the administrative program to satisfy the acceptance criteria for the SI hot legs. The next SR is 31 days from March 24, 2003, plus a 25 percent grace period resulting in a final date of May 1, 2003, before the SR is violated. TVA stated that this exigency could not be reasonably avoided for the reasons stated above and requested the licence amendment pursuant to 10 CFR 50.90 and 10 CFR 50.91(a)(6).

3.2.2 Staff Evaluation

Until questions were raised by the resident inspector about the adequacy of the administrative controls used to take credit for physically venting the hot leg SI pipes, TVA had not recognized that the subject pipes had accumulated gas. Gas was not found until the licensee subsequently examined the subject pipes by UT during the forced outage. The discovery of gas established that the administrative controls had not reasonably ensured the absence of gas, a condition that TVA believes will require it to physically conduct the periodic verification specified in its TSs unless relief is granted via TVA's exigent license amendment request. The staff finds that the time available between discovery and the requirement to vent is not sufficient for the licensee to plan and implement an effective solution to the venting requirement. In addition, the staff finds that the access conditions, temperatures, and dose rates cited by TVA constitute significant radiological and industrial hazards. Therefore, the staff finds that TVA's request for an exigent license amendment would meet the requirements of 10 CFR 50.90 and 50.91(a)(6).

As stated in TVA's submittal dated April 8, 2003, on March 13, 2003, TVA filled and vented the ECCS lines where the licensee determined that gas had accumulated. The licensee followed the venting by a UT examination, confirming that the subject pipes were filled with water. TVA believes the most likely source of the gas was an inadequate fill and vent following the previous refueling outage. The staff's evaluation of TVA's conclusion is summarized below.

TVA's submittals clarified NRC staff's concern that no system evolution would potentially have introduced gas into the subject pipes. Therefore, the staff agrees with TVA's conclusion that significant ECCS gas accumulation is not expected to occur during operation until the fall 2003 refueling outage. Based on its review of the licensee's submittals, the staff has determined that gas accumulation that may occur in the ECCS hot leg injection piping is not a safety concern because:

1. Should the ECCS be called upon, the piping of concern is not involved upon initiation or upon switching to recirculation. Hot leg gas would only be a potential concern upon initiation of hot leg injection, when the reactor coolant system would be at relatively low pressure and conditions for causing a water hammer would be unlikely.

2. Considering the amount of gas that could accumulate in the ECCS hot leg injection piping, it would be unlikely that a water hammer that could occur would result in the loss of equipment operability.

3. Injection of the accumulated gas is not of concern with respect to core cooling because the volume of gas in question is not sufficient to have a measurable impact on core cooling. The gas contained in the hot leg injection piping is not of concern when approximately 9 hours after the switchover to cold leg recirculation, hot leg recirculation is initiated to reduce the potential for excessive buildup of boric acid in the core.

The staff concludes that if the ECCS were called upon between March 13, 2003, and the fall 2003 refueling outage, the ECCS operability would be reasonably ensured when the plant is operated consistent with the TVA request.

4.0 REGULATORY COMMITMENTS

In Reference 2, TVA provided the following regulatory commitments:

In order to verify the pipe is full of water, the ECCS Pump and Discharge Pipe Venting procedure (1-SI-63-10-A) will include the following provisions:

1. Vent the safety injection hot leg at the conclusion of the refueling outage (currently in procedure).

2. When venting, have the operator note the duration of gas discharge and provide feedback to Engineering (added to procedure on November 5, 2002).

3. Perform an ultrasonic inspection following the filling and venting operation at the conclusion of the refueling outage to verify the line is filled (new commitment).

5.0 STATEMENT OF EXIGENT CIRCUMSTANCES

The Commission's regulation, as stated in 10 CFR 50.91, provides special exceptions for the issuance of amendments when the usual 30-day public notice cannot be met. One type of special exception is an exigency. An exigency exists when the staff and the licensee need to act quickly and time does not permit the staff to publish a *Federal Register* notice allowing 30 days for public comment, and the staff also determines that the amendment involves no significant hazards consideration. In accordance with 10 CFR 50.91(a)(6)(i)(A), the staff issued a *Federal Register* notice on April 16, 2003 (68 FR 18712). The notice provided an opportunity for hearing and allowed at least 2 weeks from the date of the notice for prior public comments. No comments were received.

In its submittal, the licensee discussed the need for an exigent review of the proposed license amendment. This request was submitted on an exigent basis due to an emergent issue that occurred when a recent UT of the SI system hot leg injection piping identified a quantity of gas at the piping high points. Until questions were raised by an NRC inspector on the basis for TVA's methodology for surveillance performance, TVA had no indication that the SI system hot leg injection lines had accumulated gas. Therefore, the licensee requested NRC review and approval of this license amendment on an exigent basis.

On the basis of the above discussion, the staff has determined that exigent circumstances exist and that the licensee used its best efforts to make a timely application and did not cause the exigent situation.

6.0 FINAL NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

The Commission's regulations in 10 CFR 50.92 state that the Commission may make a final determination that a license amendment involves no significant hazards consideration if operation of the facility, in accordance with the amendment, would not (1) involve a significant increase in the probability or consequences of an accident previously evaluated, or (2) create the possibility of a new or different kind of accident from any accident previously evaluated, or (3) involve a significant reduction in a margin of safety. As required by 10 CFR 50.91(a), the licensee has provided its analysis of the issue. The staff's analysis is set forth below.

The requested change would revise, for one time only, a portion of SR 3.5.2.3 of the Watts Bar TSs for the ECCS. The revision would extend, until the refueling outage in the fall of 2003, the verification that the ECCS SI hot leg injection lines are full of water. SR 3.5.2.3 currently requires a verification frequency of 31 days. The proposed amendment includes a regulatory commitment to verify the subject piping is full of water following future refueling operations.

1. The change does not significantly increase the probability of an accident previously evaluated because the proposed change does not require any change to plant systems, structures, or components. The exclusion of hot leg injection piping from the ECCS water inventory surveillance does not cause the initiation of any accident nor create any new credible limiting single failure. The change does not significantly increase the consequences of any previously evaluated accident because volume of gas in question is not sufficient to have a measurable impact on core cooling.

2. The change does not introduce any new accident initiator mechanisms. The exclusion of hot leg injection piping from the ECCS water inventory surveillance does not cause the initiation of any accident nor create any new credible limiting single failure. There are no new adverse impacts associated with the introduction of gas into the reactor core from those previously evaluated and no adverse impact created by a potential water hammer situation. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

3. The potential for introducing gas from the hot leg injection piping into the reactor core during postulated large and small break loss-of-coolant accidents does not adversely effect design assumptions for emergency core cooling or reactivity control. The proposed change will have no affect on the availability, operability, or performance of the ECCS. Therefore, the subject change does not involve a significant reduction in margin of safety.

Based on the above considerations, the NRC staff concludes that the amendment meets the three criteria of 10 CFR 50.92. Therefore, the proposed amendment does not involve a significant hazards consideration.

7.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Tennessee State official was notified of the proposed issuance of the amendment. The State official had no comments.

8.0 ENVIRONMENTAL CONSIDERATION

The amendment changes requirements with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes surveillance requirements. The NRC staff has determined that the amendment involves no significant increase in the amounts and no significant change in the types of any effluents that may be released offsite and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding 68 FR 18712. Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

9.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

10.0 REFERENCES

1. Tennessee Valley Authority, "Watts Bar Nuclear Plant (WBN) - Unit 1 - Proposed Exigent License Amendment Request Change No. WBN-TS-03-11 - Emergency Core Cooling System (ECCS) - Venting Hot Leg Injection Lines," April 8, 2003.

2. Tennessee Valley Authority, "Watts Bar Nuclear Plant (WBN) - Unit 1 - Proposed Exigent License Amendment Request Change No. WBN-TS-03-11 - Emergency Core Cooling System (ECCS) - Venting Hot Leg Injection Lines - Response to NRC's Questions (TAC No. MB8382)."

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